9. Permit Characterization:

(X) Existing Discharge
(X) Reissuance
(X) Industrial SIC Codes: 2869, 2819, 2873
(X) Discharge to 303(d) Listed Segment
(X) Whole Effluent Toxicity Program required
(X) Water Quality Limited
(X) Effluent Limited
(X) Storm Water Management Plan
(X) Private

10. Wastewater Flow and Treatment: Table 1

Outfall Number	Wastewater Source	Treatment	Flow* (MGD)
001	Hydroxylamine Production	None (non-contact cooling water)	105.43
	Oximation & Rearrangement	None (non-contact cooling water)	
	Ammonia Sulfate Production (Internal Outfall 101)	None (contact and non-contact cooling water)	
	Sulfuric Acid Production	None (non-contact cooling water)	
	Steam Generation (Internal Outfalls 301 and 401)	Oil/water separator	
	Steam Generation (annual)	Oil/water separator	
	Service Buildings	None (non-contact cooling water)	
	Rainwater Runoff	None	
002	Phenol Purification & Hydrogenation	None (non-contact cooling water)	77.36
	Caprolactam Purification	None (non-contact cooling water)	
	Hydroxlamine Hydrolysis	None (non-contact cooling water)	
	Cooling Tower	Cooling tower blowdown	
	Oximation & Rearrangement	None (non-contact cooling water)	
	Rainwater Runoff	None	
	Phenol Purification & Hydrogenation	None (emergency deluge system)	
003	Ammonia Production	None (non-contact cooling water)	22.48
	Ammonia Production (Belco Unit)	Neutralization (water treatment)	
	Ammonia Production	Separation (non-contact cooling water)	
	Synthesis Gas Production	None (non-contact cooling water)	
	Cooling Tower	Cooling tower blowdown	
	Rainwater Runoff	None	
904 - 910	Stormwater	None	Varies

* These flows represent the maximum reported flow from each respective outfall since January 2002.

See **Attachment A** for a facility diagram and process flow chart.

11. Sludge Disposal: N/A

12. Discharge Location Description: James River via Poythress and Gravelly Runs
Name of USGS topo map: Hopewell topo – 099D (See **Attachment B**)

13. Material Storage: Materials used in the manufacturing process are stored under roof cover. Fuel oils are stored in aboveground storage tanks located within bermed areas. Discharges from the storage tank containment areas are permitted via internal outfalls.

14. Ambient Water Quality Information: Ambient water quality data from a downstream station at river mile 2-JMS075.04 was used in these analyses; the station is located at Red Buoy 107 on the James River. See **Attachment C** which includes ambient river data as well as the 303(d) fact sheets; ambient data from the James River for chloride can be found in **Attachment I**.

The current thermal loading is 11.7 E10 BTU/day where Q_{001} = 85.93 MGD, Q_{002} = 50.40 MGD, T_{001} = 41.6 °C, and T_{002} = 40.3 °C (see calculation below).

$$\frac{85.93MGD(41.6^oC)+50.40MGD(40.3^oC)}{136.33MGD}=41.1^oC=106.0^oF$$

$$\left(\frac{136.33MG}{day}\right)\left(\frac{106.0^oF}{}\right)\left(\frac{8.34lb}{gal}\right)\left(\frac{10^6\,gal}{MG}\right)\left(\frac{BTU}{lb^{*o}F}\right)=12.0E10\frac{BTU}{day}$$

Note: The temperatures represent the 30-day maximum summer values as reported in the 2007 reissuance application; Q_{001} and Q_{002} are the maximum 30-day average flows reported on DMRs received between January 2003 and December 2006.

However, it is more appropriate to use the flow and temperature conditions at the time of the thermal study when developing the heat limitation. The current limitation established a maximum allowable heat and no water quality based need to lower that number is evident; thus the heat limitation will remain at 14.5 E10 BTU/day.

Ammonia: Water Quality Based Effluent Limitation. See **Attachment I** for the reasonable potential analysis and limitation development; see also **Attachment J** for the RCWQMP.

Individual Outfalls 001, 002, and 003
pH: Water Quality Standards

Heat: Best Engineering Judgment. Monitoring only; see discussion under "Combined Outfalls 001 and 002." For Outfall 003, the current limitation established a maximum allowable heat and no water quality based need to lower that number is evident; thus the heat limitation will remain at 1.5 E10 BTU/day.

$cBOD_5$: Best Engineering Judgment. Monitoring only; see **Attachment M** for discussion regarding the application of the BOD_5 allocation from the Richmond Crater Water Quality Management Plan.

TOC net: Best Engineering Judgment. The TOC maximum limitation of 10 mg/L net addition is based on the approach taken when permitting non-contact cooling waters by the Petroleum Refining guidelines. The Petroleum Guidelines indicates 5 mg/L TOC in such discharges; however, in the case of Honeywell, the cooling water is untreated river water (except that chlorine may be added). The final outfalls may also contain stormwater and in some cases, wastewater discharges from internal outfalls. Given those factors, a net TOC limitation of 10 mg/L was previously established and is considered appropriate for this facility. This limitation serves as a leak detector indicating process wastewaters combining with the non-contact cooling water waste streams.

DO: Water Quality Standards (WQS, 9 VAC 25-260-185) and Richmond Crater Water Quality Management Plan (208e plan) – see **Attachment J**. The amended WQS establish minimum DO concentrations of equal to or greater than 5.0 mg/L (instantaneous minimum) and equal to or greater than 6.0 mg/L (7-day mean) for migratory fish spawning and nursery; these WQS are applicable February 1 through May 31. The open water DO WQS are applicable year round and require a 30-day mean equal to or greater than 5.5 mg/L, a 7-day mean equal to or greater than 4.0 mg/L, and an instantaneous minimum equal to or greater than 4.3 mg/L. The Richmond Crater plan requires a monthly average minimum DO of 6.1 mg/L.

TRC: Water Quality Based Effluent Limitation; See **Attachment I**.

Total P: This parameter and limitation were initially included in the permit in accordance with the State Policy for Nutrient Enriched Waters. This policy has since been superseded with new nutrient regulations and guidelines and the issuance of the Nutrient General Permit. While the nutrient general permit limitations are more stringent than the current limitation, these limitations are not

Several metals were not analyzed using the established target values as the QLs. However, the resulting, <QL values are all less than the most stringent, applicable WQS (see the table below; all units are in µg/L).

Parameter	Target Value	Lab Result	WQS
Antimony	0.2	<5	4300
Arsenic III	1	<5	340
Copper	0.5	<5	5.9
Lead	0.5	<5	7.3
Nickel	0.5	<5	13
Selenium	2	<5	20
Silver	0.2	<1	1.5

Note: A hardness value of 61.4 mg/L as $CaCO_3$ was used to calculate the WQSs for copper, lead, nickel and silver. This value was obtained from the average value of hardness data at ambient monitoring station 2-JMS075.04 (See **Attachment C**). This downstream station is outside of the established mixing zones.

Considering the amount of dilution allotted by the mixing ratios, it is expected that the WLAs for these metals would be significantly larger than the WQS. Consequently, these metals do not exhibit a reasonable potential to violate water quality standards and were considered absent for the purposes of this evaluation.

Discussion of other potential parameters of concern follows.

Radioactivity Data Evaluation

In the application, the values reported for Beta Particle and Photon Activity are in units of concentration (e.g. pCi/L) whereas the applicable water quality standard is an exposure in terms of mrem/yr. The EPA has established this same standard for community potable water systems. Federal Regulation states that compliance with the potable water standard may be assumed if the average annual concentration of Beta Particle and Photon Activity is less than 50 pCi/L and the average annual concentrations of Tritium and Strontium-90 are less than 20,000 pCi/L and 8 pCi/L, respectively.

The reported data (in pCi/L) are as follows:

Parameter	Outfall 001	Outfall 002	Outfall 003
Beta Particle and Photon Activity	4.6	3.2	3.5
Strontium 90	<1.0 pCi/L	<1.0 pCi/L	<1.0 pCi/L
Tritium	<129 pCi/L	<129 pCi/L	<129 pCi/L

Consequently, the reported concentrations of Beta Particle and Photon Activity are considered to meet the applicable water quality standards.

Fecal Coliform Discussion

The application sampling revealed measurable concentrations of fecal coliform at each process water outfall, ranging from 50 – 500 N/100mL. These outfalls discharge once-through cooling water which originates from the James River. The water withdrawal intake is located within an area listed as not supporting the Recreation Use due to fecal coliform and E.coli impairments. Domestic wastewater from the facility is directed to the Hopewell Regional Wastewater Treatment Facility; however, boats arriving at the facility's pier may be equipped with marine sanitation devices (MSD) which could be a source of the bacteria noted in the effluent of the cooling water outfalls. Consequently, Special Condition C. 17 (Best Management Practices) is incorporated into the proposed permit, but no additional monitoring for this parameter is required at this time.

18. Basis for Sludge Use & Disposal Requirements: Not applicable, as this facility does not land apply sludge.

f. Special Condition C.6. – Water Quality Criteria Reopener
Rationale: VPDES Permit Regulation, 9 VAC 25-31-220 D requires effluent limitations to be established which will contribute to the attainment or maintenance of the water quality standards.

g. Special Condition C.7 – pH Excursions
Rationale: 40 CFR 401.17 establishes lengths of time per event and per month during which continuously monitored pH values can be outside the designated range of 6.0 to 9.0 S.U.

h. Special Condition C. 8 – Process Wet Well Operations
Rationale: This special condition recognizes the possibility of an overflow from the wet well system if the design runoff flow is exceeded.

i. Special Condition C.9 – Emergency Deluge System Monitoring
Rationale: This special condition requires monitoring of any discharge from an emergency deluge system that would be activated in the event of an explosive condition or fire in a specific process area.

j. Special Condition C. 10 – Dissolved Oxygen Requirements
Rationale: This special conditions clarifies the intent and reporting of the DO limitations established in Part I.A

k. Special Condition C.11– TOC Reporting
Rationale: This special condition provides instructions detailing the net TOC value calculations.

l. Special Condition C.12 – Heat Calculations
Rationale: This special condition provides instructions detailing the heat discharged (BTU/day) calculations.

m. Special Condition C.13 – TRC Monitoring and Effluent Limitations
Rationale: During periods when river intake water is not being chlorinated, the requirements for TRC sampling and testing are not necessary.

n. Special Condition C.14 –Stormwater Monitoring Requirement
Rationale: This special condition establishes outfalls to be monitored for sets of substantially identical outfalls and for stormwater Outfall 910 which stands alone.

o. Special Condition C.15 – General Permit Clause
Rationale: 9 VAC 25-40-30 D exempts facilities located in the Chesapeake Bay watershed from Total Phosphorus loading limits that are based on the receiving stream's previously being classified as Nutrient Enriched Waters, on the basis that more stringent annual loading limits (i.e., from the Watershed General Permit)apply to such facilities.

p. Special Condition C.16 – Instream Monitoring Program
Rationale: As a result of uncertainties related to the application of the mixing zone model, adequacy of data presented in the Hopewell Estuary Region Monitoring and Assessment (HERMA) project, and recent water quality issues that may be of concern within receiving waters, it is necessary to obtain current stream data for continued water quality evaluations. In accordance with 9 VAC 25-31-190, DEQ requires the submittal of an approvable instream ambient monitoring program and quality assurance and quality control (QA/QC) plan. The monitoring program and plan must take into consideration the findings of the HERMA study and the effluent discharge at the Honeywell-Hopewell industrial facility (VA0005291). Basic requirements for the monitoring program and QA/QC plan, in addition to the implementation schedule and reporting schedule are outlined in the special condition. DEQ encourages a joint effort between Hopewell Regional WWTF and Honeywell-Hopewell be pursued. See **Attachment Q** for further discussion.

q. Special Condition C.17 – Best Management Practices
Rationale: The receiving stream is considered impaired for bacteria (see Item 29 below). This special condition helps to address this impairment. VPDES Permit Regulation, 9

Outfall	Parameter Changed	Effluent Limits Changed		Monitoring Requirement Changed		Reason for Change	Date
		From	To	From	To		
101	$cBOD_5$	4750 kg/d	4800 kg/d	-	-	Mass loading limitations were revised to reflect the number of significant digits in the underlying federal effluent guideline, in accordance with GM06-2016 (See Attachment M)	5/08
101	TSS	3036 kg/d 9852 kg/d	3000 kg/d 9850 kg/d	-	-		
101	40 CFR 414.101 Subpart J parameters including 19 New Parameters: acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, 3,4-benzofluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, bis(2-ethylhexyl) phthalate, chrysene, di-N-butyl phthalate, diethyl phthalate, fluoranthene, fluorene, naphthalene, phenanthrene, 2, 4-dimethylphenol, dimethylphthalate, phenol, pyrene					New parameters were added in accordance with 40 CFR 414; mass loading limitations for all other parameters were revised to reflect the correct number of significant digits, in accordance with GM06-2016 (See Attachment M)	4/08
301, 401	TPH	15.0 mg/L	15	-	-	The limitations were revised to reflect the correct number of significant digits in accordance with GM06-2016.	5/08
401	TSS	30.0 mg/L 100.0 mg/L	30 mg/L 100 mg/L	-	-		5/08
998 (001 + 002)	Ammonia	7.7 mg/L 3967 kg/d 9.6 mg/L 4946 kg/d	7.74 mg/L 3670 kg/d 9.65 mg/L 4950 kg/d	-	-		5/08
904-910	Total Phosphorus, Dissolved Iron, Dissolved Aluminum	-	NL	-	1/Year	See discussion in Item 17 above.	5/08
The cover page was revised according to current boiler plate language and format; also, the river basin, section and special standards were updated in accordance with 9 VAC 25-260 et al. The receiving streams were updated to include the James River.							
Changes Made in Response to Permittee Comments Made During the June 5, 2008 Meeting							
003	E.coli	NL	-	1/6 Months	-	Uncertainty regarding the origin of the bacteria in this outfall's effluent still exists; however, additional monitoring would only confirm that bacteria are in the effluent, not the source of the bacteria. Consequently, monitoring for bacteria was removed during permit negotiations.	6/08
Changes Made in Response to Permittee Comments Received via Email on June 17, 2008							
The #2 Fuel oil storage tank that necessitated internal Outfall 201 has been demolished and removed. Accordingly, Outfall 201 was removed from the permit and associated fact sheet references were deleted. Additionally, typographical errors were corrected. See **Attachment S**.							6/08
Changes Made in Response to Permittee Comments Received during July 11, 2008 Meeting							
998 (001 + 002)	Ammonia	7.7 mg/L 3967 kg/d 9.6 mg/L 4946 kg/d	4.86 mg/L 2490 kg/d 7.29 mg/L 3740 kg/d	2/Month	1/Week	A units error was noted in the May 2008 draft permit which prompt reevaluation of the ammonia analysis; this revised analysis is included in **Attachment I**. The monitoring frequency was revised to be consistent with the monitoring requirements of the nutrient general permit. Permittee comments and DEQ response are included in **Attachment S**.	7/08

From	To	Special Condition Changed	Reason for Change	Date
Parts I.A.2, 5, 6, 7, 10	Parts I.A.2, 5, 6, 7, 10	Definitions of NA and NL added	Updated for clarity	5/08

From	To	Special Condition Changed	Reason for Change	Date
Changes Made in Response to Permittee Comments Submitted During the Comment Period & in the September 29, 2008 Meeting				
	Part I.C.16	Mixing Zone Study	Nitrate plus nitrite combined monitoring was specified and the requirement for an ammonia probe was removed.	9/08
	Part I.G	Stormwater Toxicity Testing	The first submittal date was moved to February 10, 2010 to allow sufficient time to collect the required samples and perform the toxicity testing.	9/08

26. Variances/Alternate Limits or Conditions: None.

27. Public Notice Information required by 9 VAC 25-31-280 B:
Publishing Newspaper: *Hopewell News*
Comment period: Start Date: August 22, 2008 End Date: September 22, 2008
Publication Dates: August 22, 2008 and August 29, 2008

All pertinent information is on file and may be inspected or copied by contacting Gina Kelly at:

Virginia Department of Environmental Quality (DEQ)
Piedmont Regional Office
4949-A Cox Road
Glen Allen, Virginia 23060-6296

Telephone Number 804/527-5048
Facsimile Number 804/527-5106
Email vekelly@deq.virginia.gov

Persons may comment in writing or by e-mail to the DEQ on the proposed reissuance of the permit, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within the comment period will be considered. The DEQ may decide to hold a public hearing if public response is significant. Requests for public hearings shall state the reason why a hearing is requested, the nature of the issues proposed to be raised in the public hearing, and a brief explanation of how the requester's interests would be directly and adversely affected by the proposed permit action.

Following the comment period, the Board will make a determination regarding the proposed reissuance. That determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given.

28. Additional Comments:

a. Previous Board Action: None.

b. Staff Comments:

- The flows at Outfalls 001 and 002 were not updated at this reissuance as it is more appropriate to use the flow conditions employed in the mixing zone study (e.g. it is not appropriate to update the flows without updating the model).
- The facility was issued a Warning Letter (WL) on July 3, 2007 with TOC violations cited. Consequently, the facility is not eligible for reduced monitoring at this time.
- Of the Special Standards which are listed for Section 1 of the James River, Special Standard a does not apply as designated shellfish growing areas have not been identified at the point of discharge. Special Standard z applies to receiving waters other than the James River at these points of discharge, and NEW-18 and NEW-19 have been repealed. Special Standard bb refers to Chlorophyll A levels in the James River and is addressed by nutrient limitations in the "General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia," registration number VAN040082.
- The Whole Effluent Toxicity Testing analysis, Time-to-Lethality Evaluation for HRWWTF, and Gravelly Run Fishery Survey are included in **Attachment O**. The

31. Summary of attachments to this Fact Sheet:

Attachment A	Facility Diagram and Process Flow Chart
Attachment B	Location Map
Attachment C	Ambient Data
Attachment D	Site Inspection Photos and Notes
Attachment E	Data Sources and Selected Effluent Data
Attachment F	Mixing Zone Discussion
Attachment G	Mixing Zone Study and Previous Analysis
Attachment H	Rationale Regarding Mixing Zone Correction
Attachment I	Effluent Limitation Analysis
Attachment J	Richmond Crater Water Quality Management Plan
Attachment K	Thermal Effects Study
Attachment L	Nutrient General Permit Summary
Attachment M	Application of 40 CFR 414
Attachment N	Stormwater Evaluation
Attachment O	Toxicity Evaluations
Attachment P	NPDES Industrial Rating Work Sheet
Attachment Q	Mixing Zone Study Rationale and HERMA Studies
Attachment R	SWCB Meeting Minutes, March 1995
Attachment S	Permittee Comments on the Draft Permit Package and DEQ Response
Attachment T	Public Notice Comments